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Office CBS CRANFORD

Subject 19DM DIFFUSER
WALL CALIBRATION
PER - 85 - 4

Purpose:

To inform the field of the total factory calibration for the diffuser wall module for the 19DM.

Machines Affected:

All 19DM machines using the 32SM controller.
(note - this is not necessary for machines that use the newer 32MP controller)

Information:

The diffuser control module monitors motor current as the load on the compressor changes. In response to these fluctuations, the module activates a bank of 4 solenoid valves that direct oil flow to the diffuser wall assembly. The oil pressure hydraulically varies the diffuser wall position, thereby changing the area at the impeller discharge.

The operating curve adjustments on the diffuser control module provides flexibility between operating efficiency and surge protection. Because of this fact, precise calibration is a necessity in order to insure that both conditions are met.

Procedure:

This procedure can be used with either the compressor running or while its off, however, certain setup precautions will apply for each case.

Machine Off:

The following terminals will have to be jumped out:

LI to 18 (supplies power to the diffuser control module)

LI to 86 (energizes the decrease solenoid to close wall)

Note: For the calibration to proceed the diffuser wall should be maintained in the full closed position, (bellows stem fully retracted toward motor). To do this the oil pump will have to be on either by jumping it out also or depressing the momentary switch on the control panel.

Machine Running:

The only requirement for the test with the machine running is to jumper:

LI to 86 (energizes the decrease solenoid to close wall)

The oil pump, and diffuser control module already have power with the machine on.

With either of the above procedures completed the module can now begin to be calibrated.

Calibrated Diffuser Wall Control Module to Match Feedback Potentiometer


1. Insure that all (3) of the "baby" jumpers are all in place across J2, J3, and J4, on the diffuser wall module.

Note: Some machines may have come thru requiring that no jumpers are necessary for your particular size compressor. In this case let the region office know and we will see to it that you receive the necessary jumpers to perform the test.

2. Place a standard jumper across the terminals marked J1 on the diffuser module.
3. With a digital voltmeter (range 0-10 millivolts D.C.) connected across test points TP1 and TP2 on the diffuser control module, adjust R35 until voltmeter reads $9.05 \pm .05$ millivolts D.C.
4. Next, disconnect onside of the jumper across J1 and adjust potentiometer R33 until voltmeter reads $7.12 \pm .05$ millivolts D.C.

Match Diffuser Wall Control Module to Compressor

1. Locate the machine model number on the machine nameplate. Determine the compressor code as indicated below:

Model Number: 19DMXX 

compressor code number

2. Set up the diffuser wall control module according to the compressor code as follows:
 - A) If compressor code is below 70, reconnect jumper wire to both terminals marked J1.
 - B) If compressor code is above 70, remove and discard jumper wire from J1.
3. Next, locate the compressor code in table below and remove the jumpers indicated in the table.

If the Compressor Code is in this range	Remove the following jumpers
42 - 47 49 - 54 56 - 61 63 - 68	NONE J2 J2 and J3 J2, J3 and J4
72 - 77 79 - 84 86 - 91 93 - 98 & C9	NONE J2 J2 and J3 J2, J3 and J4

Set Diffuser Wall Feedback Potentiometer

1. Connect the digital voltmeter (range 0-1 volts D.C.) across terminals 92 and 93. This should read between 0.495 and 0.945 volts. If the voltage is outside this range, adjust the locknuts on the ¼ inch shaft which actuates the feedback potentiometer. When the voltage is within the specified range (ideally at 0.725 volts) lock the two nuts on the ¼ inch shaft securely together while monitoring the voltage.

Note: Moving the nuts toward the feedback pot will increase the voltage, and visa-versa.

2. Connect the digital voltmeter across terminal 93 and test point TP4. Adjust potentiometer R37 until voltmeter reads 0± 2 millivolts D.C.

Caution: Leave the voltmeter attached to 93 and test point TP4 for at least 5 minutes to insure that the 0 millivolt signal does not stray from what was just adjusted at R37.

Calibrate Motor Current (Diffuser Control Module)

1. Connect a digital voltmeter (DVM) across terminals 93 and TP3 on the diffuser control module.
2. Set the X and Y operating curve adjustments to zero (fully counterclockwise).
3. With machine running establish a steady motor current value for this calibration. Open guide vanes manually (capacity control at Inc) until full load current is reached. Do not exceed 105% of nameplate full load amps. If full load can be maintained for a period of time, calibrate at this condition. If not, pull down to and maintain (capacity control at hold) design leaving chilled water temperature, and calibrate at this condition.
4. Calculate the required voltmeter reading using the following formula:

$$\frac{\text{Operating Amps}}{\text{Full Load Amps}} \times 5.0 + 3.0 = \text{DVM reading (in volts D.C.)}$$

5. Adjust the Motor Current Calibration on the diffuser control module so that the DVM reading equals the value calculated in step 5. The diffuser module is now calibrated to provide an 8-volt D.C. signal at FLA.

Note: At this point the diffuser module is calibrated, follow the installation and start-up manual to complete the controls check for the 32SM.

Regards,

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FIG # 1

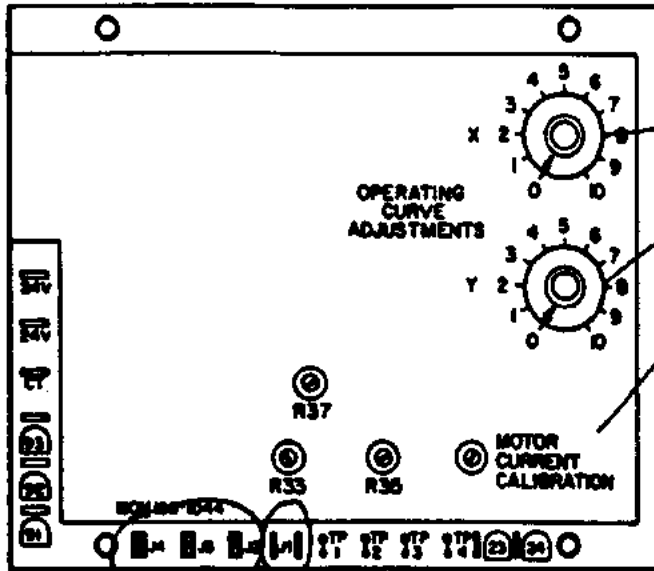


Fig. 1 - Diffuser Control Module

#1) The X and Y adjustment must be set initially at zero. Then move the calibration potentiometer to match running amps:

$$\frac{\text{Operating Amps}}{\text{Full Load Amps}} \times 5 + 3 = \text{DVM Reading (in volts)}$$

#2) These (3) jumpers must be in place initially, then, based on the compressor code 1,2, or 3 may have to be removed.

#3) This big jumper is also necessary for certain size compressors. (After calibrating diffuser wall to match feedback potentiometer, this jumper is removed for 70 size compressors and lower).

HIGHER

JUMPERS
MADE BY AMP, INC
PN - 531 220-1
.25¢ EACH
(CAN BE OBTAINED LOCALLY)